Module 1 / Topic 1

VOID RATIO (*e*) – POROSITY (*n*) RELATIONSHIP

1.1 Definitions (Fig 1.1)

$$e = \frac{V_V}{V_s}$$

$$n = \frac{V_V}{V}$$

Note: *n* is always expressed as a *percentage* unlike *e* which is expressed as a number.

1.2 Relationships

1.2.1 *n* vs *e* (Fig 1.2)

$$n = \frac{e}{1+e} \qquad (1.1)$$

1.2.2 *e* vs *n* (Fig 1.3)

$$e = \frac{n}{1-n} \qquad (1.2)$$

Notes

1) Eq. (1.1) is of the same general form as $y = \frac{x}{a + bx}$. The features of this relationship are illustrated in detail in *Sec.* 51.10; also see Kurian (2005: App.E – Sec.12).
2) It may be noted that Fig.1.3 can be obtained by rotating Fig.1.2 anticlockwise by 90^0 and viewing from the reverse side.
3) Whereas *e* can exceed the value of 1 (unity), *n* cannot exceed 100 % which is its upper limit.